

Keynote

Terascale Computing and BlueGene

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Abstract

Computer simulation is being broadly recognized as a third pillar of research in science and engineering, joining Theory and Experimentation. However the resulting modeling requirements go far beyond the capabilities of current supercomputers. I will discuss this problem as well as different solution approaches currently being tried for certain problems. This takes us into the domain of tera-scale and peta-scale computing. In addition to the significant hardware problems to be solved, we face software issues that are at least as large. I will discuss these topics in the context of BlueGene/L — a 360 teraflop/s super computer being built at IBM Research which will run on the Linux operating system. Building BlueGene/L has necessitated a number of innovations in order to achieve the targeted levels of performance. We also discuss issues of reliability and availability, the so-called autonomic issues, as well as projected applications and performance.

Biography

William R. Pulleyblank is the Director of Exploratory System Servers in IBM's Research Division and the Director of the IBM Deep Computing Institute. He has also served as the Research relationship executive responsible for Financial Services sector in IBM, the Utility and Energy Services industry, and for the Business Intelligence group. Before joining IBM Research in 1990, Dr. Pulleyblank was the holder of the Canadian Pacific Rail/NSERC Chair of Optimization and Computer Applications at the University of Waterloo. He is a member of a number of boards, including the Advisory Committee of the Division of Mathematics & Physical Sciences of the National Science Foundation, iCORE Board of Directors, the Advisory Council of the Pacific Institute for the Mathematical Sciences—PIMS, and a member of the Scientific Advisory Panel of The Fields Institute for Research in Mathematical Sciences.

In addition he serves on the editorial boards of a number of journals. Dr. Pulleyblank's personal research interests are in Operations Research, Combinatorial Optimization, and Applications of Optimization. In addition to writing a number of scientific papers and books, he has consulted for several companies including: Mobil Oil on helicopter routing; Marks and Spencer on depot management; Statistics Canada on survey validation; and CP Rail on train scheduling.